

# PATENT ABSTRACTS OF JAPAN

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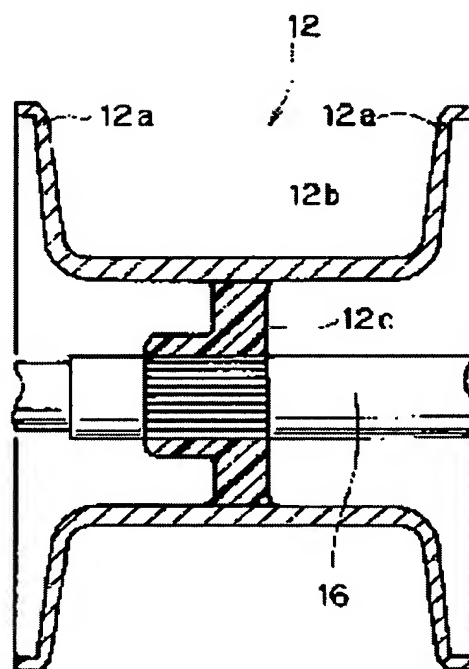
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## (54) SPOOL IN DOUBLE BEARING REEL

(57)Abstract:

**PROBLEM TO BE SOLVED:** To provide the subject spool designed to realize its weight reduction and maintain its mechanical strength as a whole.

**SOLUTION:** This spool 12 in a double bearing reel is such one as to equipped with a pair of dish-like hooks 12a, a cylindrical reeling drum 12b and a boss 12c at the central part on the inner circumferential side of the reeling drum 12b, wherein the boss 12c is made of synthetic resin, thereby realizing the weight reduction of the spool 12, and because both the hooks 12a and the reeling drum 12b are formed of metallic thin plates of press-worked aluminum alloy, the mechanical strength of the spool 12 as a whole can be maintained.



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**CLAIMS**

[Claim(s)]

[Claim 1] The spool by which it is located in the both ends of the spool drum section of the shape of a cylinder by which a fishing line is twisted around a periphery which is the spool with which the body of a reel of both the bearing reel was equipped free [ rotation ], the boss section formed in the inner circumference side of said spool drum section with synthetic resin, and said spool drum section, and it has the flange of a major diameter from the outer diameter of said spool drum section, and said a part of flange [ at least ] is formed with the metallic thin plate.

[Claim 2] The spool according to claim 1 by which all of said flanges are formed with the metallic thin plate.

[Claim 3] The spool according to claim 1 or 2 by which said a part of spool drum section [ at least ] is formed with the metallic thin plate.

[Claim 4] A spool given in either of claims 1-3 whose diameter of said spool drum section is 50% or more of a diameter of said flange.

[Claim 5] The member formed with said metallic thin plate is a spool given in either of claims 1-4 which is formed by carrying out press working of sheet metal of said metallic thin plate.

[Claim 6] It is a spool given in either of claims 1-5 by which said flange is formed with two dished metal disks, and said spool drum section is formed in said flange with outsert shaping.

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DETAILED DESCRIPTION

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[Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention relates to a spool, especially a spool of both the bearing reel.

[0002]

[Description of the Prior Art] Generally both the bearing reel is equipped with the body of a reel which has a handle, and the spool with which the body of a reel was equipped free [ rotation ]. The spool has a spool drum section, the boss section formed in the inner circumference side of a spool drum section, and the flange prepared in the both ends of a spool drum section. as for a spool drum section, a fishing line is twisted around a periphery -- it is cylindrical and a flange is a major diameter from the outer diameter of a spool drum section. Moreover, a spool shaft is equipped with the boss section and it can be freely rotated with a spool drum section.

[0003] each part material of this spool -- metals, such as an aluminium alloy, -- moreover, it is formed with synthetic resin for lightweight-izing.

[0004]

[Problem(s) to be Solved by the Invention] Although a metal spool can process the periphery section and the flange of a spool drum section of a spool with high precision and can obtain sufficient reinforcement, it cannot attain lightweight-ization easily as the whole spool. The spool made of synthetic resin can be manufactured cheaply, and tends to attain lightweight-ization. However, in the case of both the small bearing reel, in order to maintain sufficient reinforcement, it is difficult [ it ] to thicken thickness and to lightweight-ize it.

[0005] The technical problem of this invention is to maintain and lightweight-ize reinforcement of the whole spool of both the bearing reel.

[0006]

[Means for Solving the Problem] A spool of both the bearing reel concerning invention 1 is a spool with which the body of a reel of both the bearing reel was equipped free [ rotation ], was located in the both ends of the spool drum section of the shape of a cylinder by which a fishing line is twisted around a periphery, the boss section formed in the inner circumference side of a spool drum section with synthetic resin, and a spool drum section, and is equipped with the flange of a major diameter from the outer diameter of a spool drum section. Furthermore, a part of flange [ at least ] is formed with the metallic thin plate.

[0007] Here, since the boss section which is the great portion of weight of a spool is formed with synthetic resin, lightweight-ization can plan. Moreover, since a part of flange [ at least ] is a metallic thin plate, reinforcement is maintainable. Since precision can furthermore be made high by after treatment, such as cutting, the dynamic balance at the time of spool rotation can be made good. In the spool of invention 1, as for the spool of both the bearing reel concerning invention 2, all of flanges are formed with the metallic thin plate. In this case, the reinforcement of a flange is further maintainable. Moreover, since a flange is processible with high precision with after treatment, such as cutting, at the time of rotation of a spool, a dynamic balance can be made good.

[0008] In invention 1 or a spool of 2, as for the spool of both the bearing reel concerning

invention 3, a part of spool drum section [ at least ] is formed with the metallic thin plate. In this case, a spool drum section becomes lightweight and can make inertial force small. For this reason, casting distance can be developed, and it is [ backlash ] lifting-hard and it can be carried out. A spool of both the bearing reel concerning invention 4 is a spool whose diameter of a spool drum section is 50% or more of a diameter of said flange in one spool of the invention 1-3. By this spool, since the diameter of the spool drum section to a flange is large, bobbin winding capacity decreases, and the compressive force over a spool drum section becomes small. Therefore, it is possible to form a spool drum section with synthetic resin. In this case, a spool drum section becomes lightweight and can make inertial force still smaller. For this reason, casting distance can be developed, and it is [ backlash ] lifting-hard and it can be carried out. [0009] In one spool of the invention 1-4, as for the spool of both the bearing reel concerning invention 5, the metallic thin plate is formed of press working of sheet metal. In this case, processing of a metallic thin plate becomes easy. The spool of both the bearing reel concerning invention 6 is formed with two metal disks dished in a flange in one spool of the invention 1-5, and the spool drum section is formed in the flange by outsert shaping. In this case, since it is formed with another object, each processing is easy and, as for a spool drum section and a flange, can form each part with high precision.

[0010]

[Embodiment of the Invention] Both the bearing reel that adopted 1 operation gestalt of this invention is equipped with the body 1 of a reel, the handle 2 which it is arranged [ handle ] in the side of the body 1 of a reel, and rotates spool 12, and the star drag 3 for drag adjustment arranged at the body 1 side of a reel of a handle 2 as shown in drawing 1 . A handle 2 has tabular arm section 2a and handle 2b with which the both ends of arm section 2a were equipped free [ rotation ] .

[0011] As shown in drawing 1 and drawing 2 , the body 1 of a reel has a frame 5, the 1st side covering 6 with which the method of both sides of a frame 5 was equipped and the 2nd side covering 7, and the frame front cover 10 with which it was equipped ahead [ of a frame 5 ] free [ closing motion ] . The frame 5 has one pair of side plates 8 and 9 arranged so that predetermined spacing may be opened and it may counter mutually, and two or more connection sections 11 which connect these side plates 8 and 9.

[0012] The 2nd side covering 7 by the side of a handle 2 is being fixed to the side plate 9 free [ attachment and detachment ] . The side plate 8 of a frame 5 is equipped with the 1st side covering 6 by the side of a handle 2 and reverse free [ attachment and detachment ] according to the bayonet structure 14. As shown in the side plate 8 by the side of a handle 2 and reverse at drawing 2 and drawing 3 , opening 8a which can pass spool 12 is formed. Moreover, long hole 8b for equipping with a frame front cover 10, enabling closing motion free ahead of opening 8a is formed. Long hole 8b is formed aslant ahead of opening 8a, and the same long hole (not shown) as the location which also counters the side plate 9 by the side of a handle 2 with this long hole 8b is formed aslant.

[0013] The frame front cover 10 has body of covering 10a by which smooth curves which follow the side coverings 6 and 7 were consisted of, and 10d of openings was formed in anterior part, and wearing leg 10b for equipping side plates 8 and 9 with body of covering 10a, as shown in drawing 1 and drawing 3 . Moreover, piece of engagement 10e which engages with side plates 8 and 9 is formed in the front lower part of a frame front cover 10. It is movable in the hollow (not shown) by which 10f of semi-sphere-like projections is formed at the tip of this piece of engagement 10e, and 10f of this projection was formed in the medial surface of side plates 8 and 9. Wearing leg 10b is a transverse-plane KO character-like member, and shank 10c (only a side plate 8 side is illustrated in drawing 3 ) has projected it to the method of outside at both the tip. Shank 10c is prolonged in the long hole of side plates 8 and 9, and is movable to the longitudinal direction of a long hole. Shank 10c by the side of a side plate 8 is further projected from the side plate 8 to the method of outside. Such a frame front cover 10 can be freely opened and closed to side plates 8 and 9 between the closed positions shown as the open position shown in drawing 3 according to a two-dot chain line, and a continuous line.

[0014] In the frame 5, the sum rest 17 used as the spool 12 fixed to the spool shaft 16 which

penetrates a core by rotation impossible, the level wind system 15 for winding a fishing line around homogeneity in spool 12, and the reliance of the thumb in the case of performing summing is arranged. Between a frame 5 and the 2nd side covering 7, the gear device 18 for telling the turning effort from a handle 2 to spool 12 and a level wind system 15, the clutch device 13, the clutch engaging-and-releasing device 19 for engaging and releasing the clutch device 13 according to actuation of the sum rest 17, the drag device 21, and the casting control device 22 are arranged. Moreover, between a frame 5 and the 1st side covering 6, the centrifugal-brake device 23 for suppressing the backlash at the time of casting is arranged. [0015] Next, spool 12 is explained. The spool 12 equips the central part by the side of the inner circumference of dished flange 12a, cylinder-like spool drum section 12b, and 1 pair of spool drum section 12b with boss section 12c so that it may expand to drawing 4 and may be shown. Flange 12a is prepared in the both ends of spool drum section 12b at spool drum section 12b and one, and the diameter of the outermost is a major diameter from the outer diameter of spool drum section 12b.

[0016] Flange 12a is prolonged in the method of the outside of radial from the both ends of spool drum section 12b, and is prepared in the circle configuration. Moreover, flange 12a inclines so that it may incline to the method of the outside of shaft orientations toward a periphery side. Furthermore, the edge of the outermost periphery has bent to the method of the outside of shaft orientations, and forms the dished edge. Moreover, flange 12a is formed with the metallic thin plate of the aluminium alloy by which press working of sheet metal was carried out.

[0017] Spool drum section 12b has the smooth cylindrical surface where a fishing line is wound around a periphery. Moreover, spool drum section 12b is formed with the metallic thin plate of the aluminium alloy by which press working of sheet metal was carried out. Boss section 12c has the hole in the core, and is being fixed to the spool shaft 16 penetrated to the hole by rotation impossible. Moreover, boss section 12c is formed with synthetic resin.

[0018] Next, actuation of both this bearing reel is explained. In case a fishing line is rolled round, a handle 2 is turned in the direction of spool picking. Rotation of a handle 2 is transmitted to the handle shaft 30, and is further transmitted to Maine Geer 31 and the pinion gear 32 through the drag device 21. Rotation of the pinion gear 32 is transmitted to the spool shaft 16 through the clutch device 13, spool 12 rotates by this, and a fishing line is rolled round.

[0019] On the other hand, when letting out a fishing line, the clutch lever which is not illustrated is operated and the clutch device 13 is turned off. Thereby, engagement on the spool shaft 16 and the pinion gear 32 is canceled, and spool 12 will be in a pivotable condition regardless of handle 2 grade. Therefore, with the weight of a mechanism etc., spool 12 rotates and a fishing line lets out.

[0020] In such fishing actuation, with this operation gestalt, since spool drum section 12b and flange 12a of spool 12 are formed with high precision with the metallic thin plate, at the time of rotation of spool 12, a dynamic balance can be made good. Moreover, by lightweight-izing, it becomes small, and casting distance can be developed, and inertial force is [ backlash ] lifting-hard and can carry out it.

[0021] Operation gestalt] besides [

(a) With said operation gestalt, although formed by flange 12a, spool drum section 12b, and one, as shown in drawing 5, two dished metal disks may be formed in spool drum section 12b with outsert shaping as flange 12a of another object.

(b) With said operation gestalt, although spool drum section 12b was formed with the metallic thin plate, as shown in drawing 6, when the diameter of spool drum section 12b is the vadam spool which is 50% or more of the diameter of flange 12a, it may form spool drum section 12b and boss section 12c with synthetic resin by one.

(c) With said operation gestalt, although all of spool drum section 12b were formed with the metallic thin plate, as shown in drawing 7, spool drum section 12b may be divided into 12d of outer case sections, and container liner section 12e, may form 12d of outer case sections, and flange 12a with a metallic thin plate by one, and may form container liner section 12e and boss section 12c with synthetic resin at one. Moreover, as shown in drawing 8, the part made from a metallic thin plate and the part made of synthetic resin may be formed in flange 12a by extending

container liner section 12e along with flange 12a further.

(d) With said operation gestalt, although the aluminium alloy was used as a metallic thin plate, a Magnesium alloy, a titanium alloy, stainless steel, etc. may be used.

[0022]

[Effect of the Invention] Since according to this invention the boss section of a spool of both the bearing reel is formed with synthetic resin and a part of flange [ at least ] forms with the metallic thin plate, maintenance and lightweight-izing of the reinforcement of the whole spool can be attained.

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DESCRIPTION OF DRAWINGS

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[Brief Description of the Drawings]

[Drawing 1] The top view of both the bearing reel by 1 operation gestalt of this invention.

[Drawing 2] The flat-surface sectional view of said both bearing reel.

[Drawing 3] The side-face fracture Fig. of said both bearing reel.

[Drawing 4] The expanded sectional view of the spool periphery of said both bearing reel.

[Drawing 5] Drawing equivalent to drawing 4 of other operation gestalten.

[Drawing 6] Drawing equivalent to drawing 4 of the operation gestalt of further others.

[Drawing 7] Drawing equivalent to drawing 4 of the operation gestalt of further others.

[Drawing 8] Drawing equivalent to drawing 4 of the operation gestalt of further others.

[Description of Notations]

1 Body of Reel

2 Handle

12 Spool

12a Flange

12b Spool drum section

12c Boss section

12d Outer case section

12e Container liner section

16 Spool Shaft

17 Sum Rest

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[Translation done.]